Lesson Plan 07
GROUND RUBBER

TOPIC:	Fire Prevention in Tire Processing Facilities
LEVEL:	I
TIME:	30 Minutes
BEHAVIORIAL OBJECTIVE:	
Condition:	Complete evaluation with 70% accuracy
Behavior:	The student will . . . 1. Develop recommendations for inspecting facilities that reduce tires to useable rubber product.
Standard:	According to the referenced text
REFERENCES:	Slaughter, Rodney "RINGS OF FIRE: Tire Fire Prevention and Suppression" California State Fire Marshal, June 2004.
MATERIALS NEEDED:	PC projector, projection screen, VCR, multimedia slide show on CD/ROM, speakers.
PREPARATION:	Tire processing facilities help reduce the number of tires stored outdoors. But the operation requires a large feedstock of whole tires on site. Fires in the processing facility, from the heat generated from the machine and the presence of combustible fibers, are common. The altered tire material in the form of shreds, ground or crumb rubber is a material that can also be a fire problem. This section looks at what the industry is doing to prevent fires in processing facilities. New regulations exist in the ICC International Fire Code, with other recommendations coming soon in NFPA 1 Fire Code.

PRESENTATION	APPLICATION
	From the Fire Prevention menu click on the Ground Rubber button
	Ground Rubber Slide 01 Objective
I. Objective- Develop recommendations for inspecting facilities that reduce tires to useable rubber product	
	Ground Rubber Slide 02
II. Introduction	
A. Tire processing operations like chipping, retreading or grounding require piles of waste tires as a feedstock.	
B. The operation reduces waste tires to shreds or crumb rubber	
C. Fires in these facilities are common	
	Ground Rubber Slide 03 Processing Diagram
D. This slide shows the crumb rubber operation including shredding and grinding and the collection of tire fiber which is also recycled	
	Ground Rubber Slide 04
III. Regulations & Industry Recommendations	
E. Ten foot fence around the material storage area.	
F. Rubber piles 30 to 60 feet from the perimeter fencing.	
G. No ignition sources such as welding, smoking etc. near the rubber pile.	

PRESENTATION	APPLICATION
	Ground Rubber Slide 05 Fire Operations
H. This picture shows a fire operation at a crumb rubber facility in san Bernardino County	Ground Rubber Slide 06
I. Rubber pile should be frequently rotated off-site J. Altered tire material is known to spontaneously ignite and should be kept sheltered from precipitation K. In the processing line clean out rotor assembly	Ground Rubber Slide 07 Facility
L. The same San Bernardino operation showing the butler building and the extent of fire damage note tire material to the left and crumb rubber stored in the bin to the right	Ground Rubber Slide 08
M. Install dust collection system N. Keep processing area clean and clear of combustible materials O. Install fire suppression system P. Provide access doors or ports to duct system every 10 feet	
Q. The American Conference of Governmental Industrial Hygienists recommends a duct velocity of 2,500 to 3,500 feet/minute to prevent fine rubber particles from settling and plugging system	Ground Rubber Slide 09

PRESENTATION	APPLICATION
R. Experience suggests 5,000 to 5,500 feet per minute is needed to keep ductwork clean S. Airflow sensors should be installed in ductwork to monitor velocity.	Ground Rubber Slide 10 Processor conveyor belt
T. Photo shows a close-up of the San Bernardino operation with shredder and conveyor belt	Ground Rubber Slide 11
U. Automatic shutdown of fans and manual shut-off switches near equipment operator should be installed to keep from feeding air to a duct fire. V. Fire suppression systems need to have the ability to flood the ductwork with water or steam to displace oxygen and cool hot pieces of rubber. W. Bag house dust collection systems require cloth bags that are pretreated by the manufacturer to remove small fibers from the woven cloth. X. Nomex bags are recommended	

PRESENTATION	APPLICATION
Y. Alternative Means of Protection 1.While these regulations and recommendations specify the minimum fire safety requirements of a waste tire facility and waste tire processing operation 2. The CCR allows the local fire authority having jurisdiction to evaluate alternative means of protection 3. Local conditions and new technology may allow for other ways to protect tire piles and operations from a fire	Ground Rubber Slide 12 **Instructors Note:** Give summary and then read evaluation questions Ground Rubber Slide 13 Questions

SUMMARY:
Altered and processed tires present a unique kind of situation in pre-planning and in fire prevention. Not only do you need to concentrate on the whole tires stored on site, but you must also look after the processing line itself, and the piled or bagged material at the end of the process. Whether whole, shredded or ground rubber from tires will always present a unique firefighting problem to the fire service.

EVALUATION:

1. A local fire inspector should look at which areas of a ground rubber operation?
Answer: The feedstock area of incoming tires, the machinery processing the tires, and the pile of shredded or crumb rubber stockpiled in the end.

2. Why is it important for the equipment operator to be able to shut down dust collection fans?
Answer: To provide a quick response to any potential problems

3. What technology would you recommend to a ground rubber operator concerned about the temperature of a ground rubber pile? Thermal imaging or thermocouples
Answer:

ASSIGNMENT:
None